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USAF HEARING CONSERVATION PROGRAM, DOEHRS DATA REPOSITORY ANNUAL REPORT: CY2011

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14. ABSTRACT

The United States Air Force School of Aerospace Medicine (USAFSAM), Epidemiology Consult Service (PHR), Hearing Conservation Program (HCP) prepares an annual status report on the USAF HCP in accordance with Air Force Occupational Safety and Health Standard 48-20, Occupational Noise and Hearing Conservation Program, 2.5.8-9, and Department of Defense Instruction 6055.12, Hearing Conservation Program. This report covers CY 2011. The purpose of this report is to provide a corporate view of the current status of the USAF HCP with data reported from the Defense Occupational and Environmental Health Readiness System Data Repository (DOEHRS-DR). Major command and installation level reports are available quarterly and by request from USAFSAM/PHR, as well as by those who have user-defined roles in the data repository. This report covers an overview of a few standard reports currently available in the DOEHRS-DR database, software implementation status data, hearing conservation program metrics, and recommendations.

15. SUBJECT TERMS

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I. Introduction

The United States Air Force (USAF) School of Aerospace Medicine (USAFSAM), Epidemiology Consult Service (PHR), Hearing Conservation Program (HCP) prepares an annual status report on the USAF HCP in accordance with Air Force Occupational Safety and Health Standard 48-20, Occupational Noise and Hearing Conservation Program, 2.5.8-9, and Department of Defense Instruction (DoDI) 6055.12, Hearing Conservation Program. This report covers CY2011.

The purpose of this report is to provide a corporate view of the current status of the USAF HCP with data reported from the Defense Occupational and Environmental Health Readiness System Data Repository (DOEHRS-DR). Major command (MAJCOM) and installation level reports are available quarterly and by request from USAFSAM/PHR, as well as by those who have user-defined roles in the data repository. This report covers an overview of a few standard reports currently available in the DOEHRS-DR database, software implementation status data, hearing conservation program metrics, and recommendations.

II. Discussion

A. *Software Implementation Status Data*

During 2011, the DOEHRS Program Management Office and the subject matter experts (SMEs) from each service participated in a System Qualification Testing event facilitated by development, test, and evaluation for the DOEHRS-HC version 4.1, 26 April to 3 May 2011. Subsequent defect demonstration sessions were held in July and August 2011 on Defense Connect Online (DCO). The exit criteria for the event were reached with all of the severity level 1, 2, and clustered 3 defects demonstrated as fixed by DCO presentation remotely. However, a copy of the updated software was provided to the service level SMEs following the System Qualification Testing event due to concern that the DCO presentations were not sufficient validation that the defects were fixed appropriately. A courtesy copy was provided to each service in September 2011 for ad hoc evaluation. It was found that a number of significant defects remained, and there was agreement between the service level SMEs that the software was not field-ready in its current condition. At the end of 2011, an informal software testing event was scheduled for January 2012 for the service level SME to evaluate in-person the adjustments made to the software to resolve severe defects discovered during ad hoc evaluation.

The purpose of DOEHRS-HC v4.1 is to address the requirements of the Occupational Safety and Health Administration standards explained in 2003, the Occupational Noise Standards, 29 CFR 1910.95. This standard requires that thresholds for each ear be assessed and revised independently, as this provides a clearer indication of how each ear is affected by noise. Standard threshold shift/permanent threshold shift (STS/PTS) will now be tracked by each individual ear. For example, instead of the right and left ear results being reestablished at the time of a single ear PTS, only the ear where the PTS presented itself will be reestablished. These changes will affect the software functions and screen, as well as routine record keeping procedures at base and HQ levels.

B. *HCP Effectiveness Metrics*

Program Compliance:

One measure of the effectiveness of any HCP is program compliance. Compliance is defined as the number of people in a particular program who should receive annual audiograms (denominator data) compared to those people who received their audiograms (numerator data). This is one of the metrics specified in DoDI 6055.12. While it is a useful metric, it does have limitations that can influence its accuracy, and it reflects a snapshot of the data based on the collection date. Aggregate data from Preventive Health Assessment Individual Medical Readiness (PIMR) was obtained by military and civilians who required an audiogram in the occupational health module, as well the number of flyers. These data were entered for each unit by USAFSAM/PHR. At locations where the active duty unit and the Air National Guard (ANG) or Air Force Reserve (AFR) unit were co-located and sharing access to the same PIMR computer, the number was entered for the active duty unit, and the ANG or AFR unit was left blank to avoid overcounting individuals. Several new units that stood up HC programs during 2011 were manually added to the denominator data tables.

Table 1 represents the compliance data for the USAF for the year 2011. These rates are only approximates but are representative of the most current denominator in the USAF HCP.

Table 1. Compliance Trends, CY2009-2011

Group	Noise Exposed	People Tested	Compliance Rate (%)
CY2009 (10 Feb 11 report)			
Military	166,861	159,628	95.67
Civilian	32,172	25,748	80.03
Total	199,033	186,275	93.59
CY2010 (28 Mar 11 report)			
Military	166,736	163,834	98.26
Civilian	29,395	25,952	88.29
Total	196,131	190,732	97.25
CY2011 (3 May 12 report)			
Military	160,242	158,703	99.04
Civilian	26,980	26,643	98.75
Total	187,222	186,348	99.53

Threshold Shift Trends:

The key metric for any HCP is the standard threshold shift as specified in DoDI 6055.12. The current data follow the STS criterion specified in DoDI 6055.12. Permanent threshold shift is any STS that persists after the follow-up audiograms are completed and is a measure of permanent changes in hearing. Temporary threshold shift (TTS) is any STS that resolves after the follow-up audiograms are completed. TTS is a temporary loss of hearing due most likely to hazardous noise exposure and can be used to target intervention efforts for engineering controls and effective use of hearing protective devices. While PTS can be due to hazardous noise exposure, other factors, such as disease or aging, can cause permanent hearing changes. Care is necessary when reviewing STS rates. The current rates can only be compared to themselves for a given point in time. Therefore, inquiries into the DR for threshold shift information are best

viewed as a "snapshot" of the data in the repository for a given day. For DOEHRS purposes, TTS and PTS rates are directly influenced by the 30-day completion deadline for civilians and a 90-day completion deadline for military. Therefore, PTS rates are influenced by follow–up audiograms obtained outside the assigned window.

Table 2 represents the STS/PTS trend data for CY2009 to CY2011. The PTS rates show a slight decrease from 2009-2011. These data can be further broken down into military and civilian trend rates to determine if there are significant differences between these groups. **Table 3** reports STS rates for MAJCOMs from 2009-2011.

A review of the data suggests civilian rates continue to be somewhat higher than military rates. The difference is most pronounced for the PTS rates. Overall, PTS rates for both military and civilians have decreased slightly over the past 3 years. As noted above, factors other than hazardous noise exposure can influence PTS rates, the most prevalent of which is length of time working in hazardous noise environments. In some instances, military members retire and may return to the base as civilian employees in the same job duty. The effects of working in hazardous noise environments for many years will negatively affect the auditory status of many workers, as exposure over time accumulates. Some individuals will be affected by a predisposition for age-related hearing loss and/or noise-induced hearing loss. Installation and MAJCOM HCP managers are encouraged to pay particular attention to efforts directed toward civilian worker areas.

Table 2. STS Trends, CY2009-2011

Year/Group	N with Periodic	STS (%)	TTS (%)	PTS (%)
CY2009 (10 Feb 11 report)	164,378	10.01	2.90	7.12
Military	140,323	8.60	2.69	5.90
Civilian	23,415	18.62	4.12	14.50
CY2010 (10 Feb 11 report)	168,964	9.59	3.19	6.40
Military	144,788	8.19	2.89	5.30
Civilian	23,469	18.25	4.94	13.31
CY2011 (2 May 12 report)	168,767	8.62	3.00	5.61
Military	142,885	7.52	2.75	4.77
Civilian	25,097	15.01	4.45	10.55

Table 3. STS Rates for MAJCOMs from 2009-2011

MAJCOM	2009 (16 Mar 11 report) (%)	2010 (16 Mar 11 report) (%)	2011 (2 May 12 report) (%)
ACC	4.07	3.76	3.68
AETC	9.47	8.76	6.89
AFDW	5.83	5.62	5.62
AFGSC	5.54	2.83	4.09
AFMC	8.53	7.45	5.72
AFR	11.23	10.4	10.31
AFSOC	3.37	3.38	3.04
AFSPC	14.19	11.44	9.57
AMC	5.65	5.2	4.89
ANG	10.16	9.03	9.00
PACAF	5.16	5.18	3.81
USAFA	8.96	11.5	7.90
USAFE	3.86	3.26	2.99

Table 4 displays hearing profile levels for H-1, H-2, and H-3 levels for military members. These data change little from year to year. Note that the numbers for cadets differ significantly from officers and enlisted.

Table 4. Military Hearing Profiles from 2009-2011

Year/Group	No. of Personnel	H-1		H-2		≥H-3	
		No.	%	No.	%	No.	%
CY2009 (10 Feb 11 report)	154,387	142,240	92.1	7,943	5.2	4,204	2.7
Cadet	279	237	84.9	20	7.1	22	7.8
Enlisted	123,045	113,428	92.1	6,244	5	3,373	2.7
Officer	31,063	28,578	91.9	1,679	5.4	809	2.6
CY2010 (10 Feb 11 report)	156,924	144,797	92.2	8.024	5.1	4,103	2.6
Cadet	276	229	82.9	18	6.5	29	10.5
Enlisted	124,934	115,316	92.3	6,314	5	3,304	2.6
Officer	31,713	29,252	92.2	1,692	5.3	769	2.4
CY2011 (2 May 12 report)	153,431	142,035	92.6	7,631	4.9	3,765	2.4
Cadet	195	167	85.6	10	5.1	18	9.2
Enlisted	120,737	111,826	92.6	5,930	4.9	2,981	2.4
Officer	32,497	30,041	92.4	1,691	5.2	765	2.3

III. Recommendations

The DOEHRS-DR reports cited in this document reflect the data available in the data repository. Local hearing conservation program records may reflect a lower PTS rate due to the inability to resolve certain types of PTS cases within the data repository and to import/export difficulties related to baselines older than 1998. The differences between the locally reported PTS rate and the PTS rate with the DR continue to be addressed by USAFSAM/PHR through quarterly records review of common errors from each Air Force exporting location. Additionally, USAFSAM/PHR will be undertaking a more extensive analysis of the records to determine if baseline assignment significantly affects the PTS rates in the DR. The current method of biannual PTS rate reporting from base to headquarters level involves self-reporting of each hearing conservation unit through Microsoft Excel sheets. This method is inaccurate and not recommended for several reasons: (1) the definition of a PTS is not defined for the bases to create consistency in recording; (2) there are no instructions provided to the base on the appropriate data source for this information; and (3) entries are completed by hand, which can often lead to errors. Although the PTS rates in the data repository are affected by a DoD business rule change, and maybe be elevated compared to the actual PTS rates, the data are consistently handled in the same manner, unlike the locally generated Microsoft Excel sheets.

We strongly recommend installation and MAJCOM HCP managers review their respective programs using the metrics given in this report, as they give an initial guideline to estimate program effectiveness. Installation level reports are available for installation HCP managers to use quarterly and by request. If not already obtained, HCP managers are encouraged to apply for a DOEHRS-DR website password to gain access to these reports. MAJCOM HCP managers can also request MAJCOM access to assess trends in their respective MAJCOM. All are encouraged to contact the Hearing Conservation Program Manager at USAFSAM/PHR for assistance.